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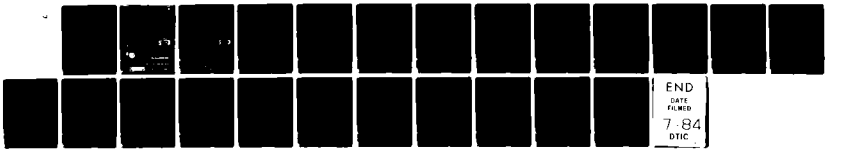

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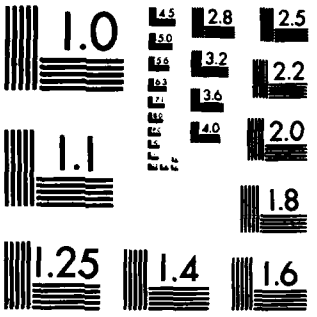

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Military Occupations: The Cutting Edge for Women?*

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Military Occupations: The Cutting Edge for Women?

Anne Hoiberg

In 1972, the military initiated plans to increase the numbers and expand the role of women in the enlisted ranks. The increase in women's enlistments, which was necessitated by the gradually declining number of male applicants, was reflected by a change from two percent of the enlisted force in 1973 to more than eight percent in 1980. The percentage is expected to reach 11 percent in 1983 or nearly 200,000 enlisted women (Deputy Secretary of Defense, 1978). The expansion of women's role in the military was an outgrowth of the passage in 1972 of the Equal Rights Amendment. Beginning at that time, the Department of Defense intensified efforts to enhance the military's image as a model of equal opportunity which resulted in the subsequent opening to women of all occupational specialties, except those related to combat (Comptroller General of the U.S., 1976). Thus, personnel needs and equal opportunity considerations led to an increase in women's assignments not only to such traditional jobs as clerical, administrative, and health care specialties, but also to jobs traditionally associated with men. The purpose of this paper is (1) to review and evaluate the progress and performance of women in military and civilian nontraditional jobs, (2) to identify the techniques and applications of military psychology that evolved from these assignments, and (3) to predict what effects these contributions of military psychology will have upon the military and civilian experience in the future.

Historically, women have responded to our country's call to serve during times of crises and have served in various civilian and military roles. Prior

to don the uniforms of these occupations even though it had been reported in a 1917 publication, as cited by Hewitt (1974), that throughout the war effort women would never be attired in trousers or uniforms of men's jobs.

As in the Spanish-American War, women were again recruited to serve as nurses in the U.S. Army Nurse Corps. The Navy enlisted approximately 13,000 women to serve as clerical workers and electricians (radio) in order to free men for sea duty. In addition to clerical work, many of these 13,000 women served as translators, draftsmen, fingerprint experts, camouflage designers, and recruiters (Thomas, 1978). In 1918, the Commandant of the Marine Corps authorized the enrollment of 300 women to perform clerical work at Headquarters Marine Corps. Thousands of women across the U. S. responded to the newspaper announcements. In New York City alone, 2,000 women flooded the recruiting office the day after a newspaper ariticle appeared which read that the Marine Corps was looking for "intelligent young women." More women were enrolled than needed because it was assumed that it would take about three women to perform the work of two male clerks, an assumption soon proved to be erroneous (Hewitt, 1974). After the signing of the Armistice in 1919, the process of discharging women began and by 1922 the last woman had returned to civilian life, leaving the military an all-male institution once again, except for the U.S. Army Nurse Corps.

In World War II, a total of 350,000 military women served in capacities ranging from the usual clerical, administrative, and health care specialists to airplane mechanics, gunnery and instrument flying instructors, parachute riggers, air traffic controllers, metalsmiths, and airplane ferry pilots (Binkin & Bach, 1977). About 800 Women's Airforce Service Pilots (WASPs)

flew all types of military aircraft, including combat planes, from one base to another and from continent to continent. These women, however, were not given full military status as aviators, yet one was killed in action when her plane was hit by enemy artillery.

Women in the labor force during World War II accounted for a third of all workers, approximately 19 million women by July, 1945 (Gregory, 1974). Although reluctant at first to register for a defense job, women were convinced through numerous publications, announcements, and posters that the war could be terminated sooner if they joined the labor force (Flynn, 1942; Glover, 1943). The distinction between a "man's job" and a "woman's job" faded with each published feature article or advertisement showing the well-dressed female factory worker attired in a visored cap, slacks, and short-sleeved blouse. Women worked in all aircraft occupations from welder to test pilot, accounting for 50 percent of all aviation workers. Three women tested the Hell Cats! In the shipbuilding yards, also discussed by Gregory (1974), the largest proportions of women worked as shipfitters (36%), machinists (14.6%), electrical workers (10.2%), and service and maintenance workers (9.6%). In the steelmaking industry, where the work was extremely strenuous, heavy, hot, and dirty, women were tried on almost every job except the most strenuous or difficult. Approximately 11 percent of the workers involved in steel production were women. Women also worked in artillery and ammunition production, as farm workers in the Women's Land Army of the U.S. Crop Corps, in the railroad industry, and as clerical workers. The largest proportion of wartime women employees, however, was in factory work.

The performance of women in nontraditional jobs during World War II was examined by several government agencies and summarized by Gregory (1974). In a 1943 study of 130 firms, which employed 154,587 women and 242,297 men, women's performance was reported as equal to or greater than men's in 88 percent of the 130 plants. Where women's production was less than men's, the strength factor was usually involved. Another study showed that women performed proficiently in 80 percent of more than 1,800 job classifications while yet another study indicated that women were employed in all but 30 of 534 distinct occupations. The most interesting finding of these studies was that training costs and programs for women were minimal; for example, of 700,000 workers who received training to learn advanced skills, less than one percent were women. The Head of the War Manpower Board (Paul V. McNutt) concluded that women during World War II proved that they could do, or learn to do, almost any kind of work (Flynn, 1942).

After World War II, between 75 and 80 percent of all women workers expressed a wish to remain in the labor force--primarily because of economic responsibilities. However, in late 1945, women found that many plants where they had worked during the war advertised "for men only." As the U. S. economy sunk into a post-war recession, employers stated that in having the choice, they preferred to hire men. Walter Reuther recommended, to no avail, that six million peacetime jobs be created to utilize the capabilities of these displaced female factory workers of whom five percent were skilled workers--as well as the returning war veteran. For the most part, women were unable to

remain at the nontraditional jobs they had held during the war. Also of great importance was the fact that women did not obtain nontraditional jobs in the two major growth sectors of the economy: housing and consumer goods production (Chapman, 1980). In recent years, there has been an increase of women in such nontraditional jobs as commercial airplane pilot, telephone repair worker, lawyer, physician, and construction worker. Although this trend is expected to continue during the 1980s, the overwhelming majority of women (80% or about 33 million) will be employed in traditionally female occupations which offer few opportunities for advancement or substantial increases in pay (Goodin, 1980). Only 3.4 percent of the gains in women's employment by 1985 will be in craft jobs (Polit, Nuttall, & King, 1979).

On the basis of this historical review, we can understand why women view the occupational opportunities in the military with considerable interest. An important reason for this increased interest is the fact that military pay for women exceeds the annual wages that a high school graduate with less than a college degree can earn in the civilian sector (Binkin & Bach, 1977). The desire to make something of their lives and to receive training or future educational opportunties were the most important reasons for enlisting given by a sample of 1,000 Navy men and women, as reported in a study conducted by Thomas (1977). Since 1973, the type of training received by women and their subsequent occupational assignments have increased steadily into nontraditional jobs. Major increments in women's job assignments were noted in motor transport, law enforcement, communications, and mechanical repair and maintenance (Comptroller General of the U.S., 1976).

This shift in women's occupational assignments from traditional to nontraditional jobs has been observed in all branches of the Armed Force. This trend will continue as each service becomes increasingly more dependent upon the technical skills of highly trained individuals who can operate, repair, and maintain technologically sophisticated equipment and weaponry. Further, the need for trained individuals, as contrasted with support personnel, will escalate in the future because of the eventual replacement of obsolete equipment, ships, and aircraft with the very latest in technological advancement. Military technology, therefore, has played a crucial part in expanding women's occupational role, particularly in the Air Force and Navy where the demands for technical and craft personnel are the highest of all branches of the military.

Contributing to the policy of effectively utilizing women in these jobs has been the work of military research psychologists. Aside from the World War II evidence that showed women served in a wide range of jobs and environments, a systematic examination and documentation of women's capabilities and performance in nontraditional jobs had not been undertaken until recently. Little is known of women's service in subsequent hostile actions other than the fact that during the Korean Conflict the number of military enlisted women (22,000 in 1950 which increased to 35,200 by 1955) represented less than two percent of the enlisted force (Goldman, 1973). Even after the lifting of the two percent ceiling in 1967, the numbers of military women remained below that percentage although more than 7,000 women served in support roles during the Vietnam War and received combat pay (Coye, 1980). Since the

opening of nearly all occupations to military women in the early to mid-1970s, the role of enlisted women in nontraditional jobs has received considerable research support. The second part of this paper will examine the contributions made to this effort by military psychology, research that will have an impact on the utilization of women and, therefore, will be considered in the long-term as the cutting edge for women in nontraditional jobs.

During the early phase of integrating women into nontraditional jobs, personnel planners requested researchers to develop physical standards for all occupational specialities, especially those with strenuous demands, and to devise methods for measuring the capabilities of men and women to perform these jobs. As an initial step in this endeavor, several "troublesome" jobs were identified, i.e., occupational specialties which appeared to involve potentially strenuous and operational demands (Comptroller General of the U.S., 1976). In the Air Force, for example, eight jobs were identified including airframe repair specialist, aircraft maintenance specialist, jet engine mechanic, materiel facilities specialist, vehicle operator/dispatcher, aerospace ground equipment repairman, helicopter mechanic, and corrosion control. The Army jobs of ammunition storage specialist, parachute rigger, medical specialist (ambulance driver), military policeman, CH-47 helicopter mechanic, and wheel vehicle mechanic were the physically demanding jobs listed. Seven Navy jobs were identified such as aviation machinist's mate, aviation structural mechanic, operations specialist, boatswain's mate, quartermaster, aviation ordnanceman, and engineman. Three jobs were listed for the Marine Corps: heavy vehicle operator, organization automotive maintenance, and electrical

repairman. The major difficulties for women were strength limitations. Many women (and some men) did not have sufficient strength to satisfactorially perform such tasks as: changing tires; removing batteries, wheels, universal joints, and crew seats; closing dragchute doors; breaking torque on bolts; bending conduit; lifting and handling toolboxes, 100-pound sandbags, 80-pound paint cans,or boat lines that weight as much as seven pounds a foot; handling anchor gear, mooring lines, and cargo; carrying equipment up ladders or tools up telephone poles; and loading and unloading patients.

In efforts to identify the physical standards and requirements for these and all jobs, military psychologists have conducted, or currently are conducting, research in this area within all branches of the military. Air Force psychologists, for example, developed a system to classify each specialty according to the physical activity involved, ranging from sedentary to heavy work (Office of the Assistant Secretary of Defense, 1977). Only 16 percent of all enlisted Air Force jobs fell within the heavy physical activity category, half were considered to be of a moderate level of activity, and 35 percent encompassed light duty. The individual's ability to perform the work in these categories was reflected by the successful demonstration of lifting weights to certain specified heights. Of the women tested, 25 percent were able to lift 70 pounds to a height of six feet, the most stringent test, while all women qualified for assignment to the light duty specialties which required the lifting of 20 pounds to elbow height. This work on physical standards for the Air Force has been expanded during the past few years; the Aeromedical Research Laboratory at Wright-Patterson Air Force Base has been tasked with developing tests of strength and stamina which will lead to more

effective selection and classification quidelines (Christal, 1978).

In the Army, a review of the physical standards data revealed that no information relevant to this topic had been collected as of 1975 (Weisz, 1978). With the entry of women to the U.S. Military Academy, however, military psychologists began to collect data on physical differences and simililarities between men and women cadets. On the basis of that information, a physical training program was developed specifically for women cadets (Priest, Vi rs, & Prince, 1978). Enlisted women, on the other hand, now receive the sam asic training as men which also includes the same combat training (Woelfel, '8). Another important research issue for military psychologists will be the determination of whether or not women possess sufficient strength to take part in combat. A study is currently underway that will examine the use of women in combat-related specialties. Findings reported from the MAXWAC experiment (Savell & Johnson, 1980), which is another example of the research conducted by military psychologists, showed that performance for five types of companies was not adversely affected by as high a proportion of women as 35 percent. Other results from that study, however, indicated that men's overall performance on nine field tasks was superior to women's. These non-MOS tasks included: loading and unloading supplies and equipment, field stripping, moving or emplacing weapons, putting up and taking down tents, digging foxholes, clearing fields of fire, establishing sanitary facilities, and filling sandbags. Men were observed as spending more time than women at these tasks which suggested that men were "picking up the slack" created by women or that women were devoting more time to less physically demanding tasks. In either case, military psychologists no doubt will be requested to develop

physical training programs that will enhance women's abilities to perform not only these non-MOS tasks but also those required of physically demanding jobs.

Prior to 1978, the Marine Corps had not initiated any research studies specific to physical standards or the utilization of women in nontraditional jobs. At present, military researchers are reviewing the strength requirements of all enlisted Marine Corps jobs (Harrison, 1980).

In August 1977, the Navy Personnel Research and Development Center (NPRDC) in San Diego was tasked with developing physical standards for all Navy jobs. This project encompassed three objects: (1) to develop a Strength Test Battery to be used at an AFEES or Recruit Training Center, (2) to determine the actual strength requirements of specific job tasks, and (3) to evaluate the ability of the Strength Test Battery to predict performane of the most physically demanding tasks (Robertson, 1980). After identifying 11,000 demanding job tasks, a taxonomy of 11 Basic Body Efforts was created to cover the 1,000 unique tasks identified. Such tasks as carrying, lifting, and pulling objects as well as turning a crank, locking a water-tight door or scuttle, and closing a water main were then translated into the nine tests of the Strength Test Battery. Selection of these tests was based upon the work of Fleishman, The Structure and Measurement of Physical Fitness, which was funded by ONR in the early 1960s (Fleishman, 1964). Scores on the nine tests have been found to be predictive of muscular capability as well as attrition from UDT training. The development of performance tests is currently underway.

In addition to this undertaking, researchers at NPRDC and the Naval Health Research Center are currently identifying the physical requirements of general shipboard tasks, including extricating injured personnel, controlling fire

hoses, climbing a ladder and raising a hatch/scuttle, and opening and closing water-tight doors. These tasks have been specified by OP-01W as being of immediate importance for Congressional hearings. After determining the percentages of men and women who can perform these tasks, an outgrowth of this research will be the development of physical training programs that will incorporate exercises designed to increase the upper-body strength needed to effectively execute these tasks. Researchers at the Naval Health Research Center no doubt will be tasked with this endeavor.

Other research areas associated with physical differences between men and women concern human engineering and human factors. In addition to updating the anthropometric data on Army women (the last published report appeared in 1946), military researchers at the Army's Human Engineering Laboratory have been engaged in designing combat materiel specifically for women--although women are not intended for the forward area in the event of hostile action (Weisz, 1978). For example, a modified suspension system was designed for the Kelvar helmet to fit the head of the 5th percentile woman. Other work resulted in the re-design for women of the XM-29 gas mask, fatigues, and boots as well as the incorporation of modifications to vehicles of various sizes which made it possible for smaller individuals to operate them.

Human factors engineers for the Navy have developed several models for workplace evaluations as well as workplace changes to accommodate women (Bittner & Moroney, 1978). Work conducted to date has dealt with identifying design problems in the work setting as well as those associated with tools and equipment handling. Another design area for Navy researchers is that of clothing and gear for women. In July 1978, Navy designers had yet

to receive a request to design for women such items as foul-weather gear and steel-toed shoes, work that has since been initiated to meet the clothing needs of women assigned to ships.

While these physical considerations are of utmost importance, military psychologists also are concerned with the effects upon women's performance in nontraditional jobs of other factors such as aptitude, interests, attitudes and values (especially those related to sex roles), tokenism, and illness and injury. With regard to aptitude measures, it has been shown that women have lower mean scores than men for the areas of general mechanical, electronics, and motor mechanics (Binkin & Bach, 1977). Thomas (1976), however, noted that sex bias on tests of this type may be an issue of greater magnitude than that of racial bias. Military psychologists working for the Air Force have given high priority to evaluating the appropriateness for women of mechanical aptitude measures on the ASVAB and to developing new measures (Guinn, 1978). In another Air Force study, Christal (1978) reported that comparisons of work in the aircraft mechanic specialty revealed there was little difference between men and women in their performance even for tasks classified as "heavy" or "dirty;" however, women's mean scores for the mechanical composite were significantly lower than men's mean values.

Also learned from the work of military psychologists and government agencies was the finding that women tend to be somewhat less interested in working in nontraditional than traditional jobs (Comptroller General of the U.S., 1976). As an example, Alley and his associates (1976) compared mean scores between Air Force men and women on the Vocational Interest Career Examination (VOICE) and found that women preferred jobs in medical care, technical and allied

specialties, and material receipt, storage, and issue while men preferred aircraft mechanics, radio/radar equipment repair, radar and air traffic control, miscellaneous communications and intelligence specialties, and service and supply.

To counteract these potentially culturally-based aptitude and interest factors, it has been recommended that the military initiate recruiting efforts in junior and senior high schools to expose girls to the opportunities in nontraditional jobs before many lose interest in the prerequisite course work of math and science (Polit, et al, 1979). Another recommendation made was that the military, especially the Air Force, develop educational programs to interest women and encourage them to consider work in these jobs. Another facet of the aptitude and interest issue is to provide remedial training for women which would enable them to meet the requirements of assignment to training in a nontraditional job. The military, with the help of military psychologists and educators, has developed academic remedial training programs to improve the reading skills of men and prepare them for training and work in military occupations. These programs date back to World War I and have been a vital part of the training centers during times of increased manpower needs (Hoiberg, 1980). Recently, a math remedial training program was developed and implemented in the Navy which could prove beneficial to many women in helping them overcome what is commonly called "math anxiety." Such programs may become of even greater importance in the future as the military attempts to fill the gaps left by our educational system and to enhance the utilization of both men and women in an increasingly more technologically sophisticated military.

Considerable research in the area of attitudes and values concerning women in nontraditional jobs and roles has been reported during recent years. In an Army study conducted by Savell and his associates (1979), the majority of respondents endorsed the assignment of women to all of 24 general occupations except for that of "rifle-carrying foot soldier." Most officers and enlisted men and women were in agreement with or were highly in favor of the Army's policy to expand women's role into nearly all occupations. In another Army study, Hicks (1978) reported that both men and women rated Army women assigned to nontraditional jobs similarly: pushy, masculine, unattractive, and hard. Women also responded that they were treated with little respect from their male counterparts; only 13 percent of the women agreed that Army men treated Army women with the same respect accorded civilian women. Durning (1977), however, reported that Navy women assigned to nontraditional jobs felt their work afforded them greater feelings of self-esteem than was noted for women in traditional jobs. Air Force men and women in maintenance jobs held similar views in that their work was rated as interesting (Christal, 1978). In general, numerous researchers, as summarized by Polit, et al (1979) and Army researchers (Deputy Chief of Staff for Personnel, 1976), concluded that women's work or performance tends to be rated less highly or less demanding than men's, which could have adverse effects upon unit performance. In efforts to combat these widely-held negative attitudes, supervisors will be tasked with promoting greater work group unity by treating men and women alike and by evaluating personnel on an equal basis.

Another area of military research interest that has evolved recently is the study of the effect of a disproportionate sex ratio upon women's performance. The concern about percentages of women in work groups is reminiscent of the racial issue that was studied during the Korean conflict when Blacks were integrated for the first time into military units. Kanter (1977) has cautioned that the name of the game is numbers in that mixed-sex work groups should have at least 20 percent women in order to avoid the dangers of tokenism. This research issue is currently being examined by Bach (1980) and Thomas (1980).

The final area concerned with the contributions of military psychologists is that of research on the health of military personnel. Because of the high costs of illness and injury in terms of military readiness, human suffering, and disability, the military has become increasingly supportive of funding occupational and environmental research programs. With regard to women's health, results have been published that showed women's hospitalization rates were more than twice the rates for men in comparisons of total hospitalizations and several diagnostic categories (Hoiberg, 1979). When comparisons were conducted by occupational categories controlling for pay grade, the differences in rates between Navy men and women tended to diminish (Hoiberg, in press). For nontraditional jobs, the rates for accidents and injuries were substantially higher for women than men only at the E-2 pay grade level which was attributed to women's inexperience in performing their work tasks. Relatively high rates of hospitalizations for strains, sprains, and dislocations were noted for both men and women in nontraditional

jobs. With the help of human engineering and human factors researchers, these rates will be reduced through the improved re-design of work spaces and equipment. With the ingenuity of both men and women, more effective and safer ways of transporting heavy objects, rather than bodily lifting, carrying, and pulling, will be devised.

The third and final part of this paper is to predict what effects the contributions of military psychologists will have upon the military and civilian experience in the future. Since World War II, the military has become the primary provider of occupational training for enlisted personnel, most of whom enter the service with few marketable skills. The training programs offered cover a wide range of occupations that require various qualifying scores on aptitude measures. Many training programs, which in the Navy encompass such a diversity as apprenticeship course work for general sea duty to polaris electronics technician, have been developed by military psychologists. Through these programs and their subsequent experience, military personnel in numerous specialties have been in high demand to leave the service for a civilian job. In fact, many civilian industrial managers, who tend to know a great deal about cost effectiveness, depend upon the military to supply them with highly trained technicians. During the decade from 1964 to 1973, for example, the Air Force placed in the labor force nearly 700,000 skilled workers at journeyman technician or specialist level--at no training costs to the companies (Vitola, Mullins, & Brokaw, 1974). And, that number only included first-term personnel! To the military's disadvantage, the extent of transferability of skills to civilian jobs has increased for the majority of enlisted jobs, primarily because the military has become more technologically sophisticated. For example, the enlisted occupations with the highest annual rate of growth are

electronics technicians and aircraft and motor transport mechanics and repairmen, and the rate of growth for these occupations is even greater in the civilian sector (Haber, 1974). This demand for manpower and womanpower in military and civilian nontraditional jobs will continue to increase during the 1980s. Moreover, the contributions that military psychologists have made in the areas of physical standards, strength batteries, physical fitness programs, anthropometry, human engineering, aptitude measures, interest inventories, assessments of attitudes and values, psychosocial issues (e.g., tokenism), health considerations, and training programs will lead to a more effective utilization of both men and women in military and civilian nontraditional jobs. Other government agencies, the unions, and private industrial managers in the near future will look to the military and to military research psychologists to learn about enhancing the person-job fit, particularly for women in nontraditional jobs. Thus, it can be concluded that military psychology, through the many contributions discussed, is indeed the cutting edge for women in nontraditional jobs.

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The purpose of this paper is (1) to review and evaluate the progress and performance of women in military and nontraditional jobs since 1900, (2) to identify the techniques and applications of military psychology that evolved from these assignments, and (3) to predict what effects these contributions of military and civilian experiences in the future.

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